WPVM-LP

Mountain Area Invormation Network

Asheville, North Carolina

Technical Exhibit for Comments in
Docket 99-25
Low Power FM

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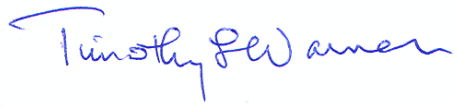
Declaration

I declare, under penalty of perjury, that I am a technical consultant to broadcasting and other communications systems, that I have over twenty-five years of experience in the engineering of broadcast and other communications systems, that I am familiar with the Federal Communications Commission's Rules found in the Code of Federal Regulations Title 47, that I am a Professional Engineer registered in North Carolina, that I have prepared or supervised the preparation of the attached Technical Exhibit for Mountain Area Invormation Network, and that all of the facts therein, except for facts of which the Federal Communications Commission may take official notice, are true to the best of my knowledge and belief.



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22 August 2005

Narrative

Mountain Area Invormation Network ("MAIN") is the licensee of WPVM-LP, file number BLL-20040126AIK, Asheville, North Carolina. MAIN filed an application for WPVM-LP in the initial window for LP100 stations for the state of North Carolina. WPVM-LP has provided LPFM service to Asheville for over 18 months. Since its inception, the service area of WPVM-LP has been limited by incoming co-channel interference from WIMZ, Knoxville, Tennessee, in excess of the level which would be expected for a fully spaced LPFM station. This Exhibit explores the reasons for the interference and possible remedies.

Allocations

A present channel allocation table is included on page 9. When rounding is considered, the site is fully spaced with respect to WIMZ. Note that there are multiple short spacings which result from the ex post facto application of separation distances to translator applications filed in 2003. The relationship with translators will be described later in this Exhibit.

A possible alternate channel allocation table is included on page 10. The proposed site is nine arc seconds East of the licensed site. Channel 237 is shown. On Channel 237, the LPFM facility is short spaced to second adjacent channel station WAEZ, Greeneville, Tennessee. There is short spacing to the licensed facilities, the present Class C allocation, and a proposed Class C0 allocation. Protection of WAEZ by lack of overlap of prohibited contours will be described later in this Exhibit.

Terrain Sensitive Propagation Analysis

To understand the source of the present interference to WPVM-LP, an incoming interference analysis was prepared using the Longley-Rice v1.2.2 propagation model. Figure 1 shows the results for co-channel and first adjacent channel allocations and construction permits. Where a facility has a construction permit and licensed facilities, only the facility with the greater impact is shown. In addition, W251AO, a translator station with a construction permit, is listed because it has an application on file to move to co-channel 278.

Propagation analysis parameters are shown on the figure. Interference is shown for 0.5 kilometer square cells. Terrain elevations were extracted at 0.1 kilometer intervals from the V-Soft Communications NED 03 terrain database. The NED 03 database is derived from the USGS National Elevation Data 30 meter terrain database. The USGS National Elevation Dataset has been developed by merging the highest-resolution, best-quality elevation data available across the United States into a seamless raster format. NED is the result of the maturation of the USGS effort to provide 1:24,000-scale Digital Elevation Model (DEM) data for the conterminous US and 1:63,360-scale DEM data for Alaska.

A color legend on Figure 1 identifies the facility which produces the greatest interference to WPVM. The population with and without interference is tabulated below:

Population Database: 2000 US Census (SF1)
Percentages calculated using a baseline population of 205,097.

Stations which cause interference			
Call Letters (Channel)	Population	%	Area (sq. km)
WKVS.C (277)	2,043	0.996	59.23
W251AO.A (278)	4,330	2.111	59.78
W279AI (279)	120,897	58.946	787.00
WSOCFM (279)	28,575	13.932	234.32
WOLT (277)	24,437	11.915	215.43
WZSN (278)	85,518	41.696	581.09
WIMZFM (278)	76,320	37.212	548.95
WZVA (278)	3,932	1.917	32.25

Masking Summary	Total Interference		Unique Interference	
Call Letters	Population	%	Population	%
WKVS.C (277)	2,043	0.996	0	0.000
W251AO.A (278)	4,330	2.111	2,497	1.217
W279AI (279)	120,897	58.946	25,107	12.242
WSOCFM (279)	28,575	13.932	1,263	0.616
WOLT (277)	24,437	11.915	0	0.000
WZSN (278)	85,518	41.696	2,835	1.382
WIMZFM (278)	76,320	37.212	20,309	9.902
WZVA (278)	3,932	1.917	517	0.252

Totals for WPVM-LP (278)		
Calculation Area Population:	367,135	5025.7 sq. km
Not Affected by Terrain Loss:	205,097	4112.2 sq. km
Interfered Population:	154,647	3839.0 sq. km
Interference Free:	50,450	273.3 sq. km
Percent Interference:	75.40	
Interference Free Breakdown:		
White	42,815	84.9%
Black	4,849	9.6%
Hispanic	1,561	3.1%
Native American	172	0.3%
Asian	358	0.7%
Pacific Islander	9	0.0%
Mixed Race	623	1.2%
Other	63	0.1%
Total	50,450	

In summary, when only co-channel and first adjacent channel facilities are included, WPVM-LP can provide interference free service to less than 25% of the population within its protected 60 dBu which is not itself terrain obstructed. When the total population within the 60 dBu F(50,50) contour is considered, WPVM-LP can provide interference free service to less than 14%. The simplified distance separation methodology for LPFM allocation produces results which are not conducive to the survival of LPFM.

Figure 2 shows the terrain around the WPVM-LP site and between Asheville and Knoxville. The color legend shows higher elevations in general along the North Carolina – Tennessee border. However, the French Broad River valley cuts a passage through the mountains which allows WIMZ (and other Knoxville stations) to serve the Asheville area in ways which are not considered in the standard separation distance tabulations.

Contour Protections

Non-commercial FM stations are allocated by a contour protection methodology as described in the FCC Rules and Regulations, 47 C.F.R §73.509. If the same methodology were permitted for LPFM allocations, additional channels would be available which could allow WPVM-LP to better serve the Asheville area. For instance, channel 237 would be available, as shown in the alternate channel allocation table. On channel 237 there is a short spacing to second adjacent channel 235 WAEZ, Greeneville, Tennessee. However, the intervening terrain is such that there is no predicted interference.

Alternatively, 47 C.F.R. §73.215 provide a method where commercial FM stations can propose facilities where the site separation does not meet the allocations distance as long as prohibited contour overlap, using the same ratios as §73.509, is avoided. Section 73.215 requires certain distance protections, but reduced from full spacing. Both full service noncommercial and full service commercial FM stations have the ability to locate facilities based on contour protection.

Figure 4 shows the 60 dBu F(50,50) protected service contours for WAEZ and for a hypothetical WPVM-LP channel 237 facility, and also the 100 dBu F(50,10) interference contours for each facility. The 100 dBu F(50,10) contour for a LPFM facility is so small that

it is not readily visible as a contour distinct from the site identifier in Figure 4. The interfering contours fail to overlap the protected contours by a significant distance.

If contour protection using the methods in §73.509 were permitted for LPFM facilities, the result would be a significant increase in the number of locations where LPFM stations could serve the public. Alternatively, extending the methods of reduced separations plus contour protection from §73.215 would likewise increase the flexibility of site selection for LPFM facilities.

Contour protection studies do involve costs. However, the costs are minimal when compared to the costs of attempting to provide service from locations which, due to terrain, are subject to loss of service and incoming interference which can negate the usefulness and economic viability of an LPFM facility.

Translator Separations

As shown in the allocation table for the current channel, the present site would not be available for a new LPFM facility because translator applications have been filed which would preclude an LPFM filing. Figure 3 shows the preclusion zones around the present WPVM-LP site due to translator applications.

WPVM-LP is exploring the possibility of a minor modification. However, there is no location which can protect all of the prior filed translator applications which also meets the LPFM minor modification standards. Since a number of the 2003 translator applications are still expressions of interest in locations and frequencies, and not full applications, even applications which are probably defective limit the availability of sites for WPVM-LP. See for instance the application of W251AO, file umber BNPFT-20030312AQW. The application

proposes a directional antenna with a relative field of .027 toward WPVM-LP, a reduction of signal of more than 30 dB. Despite the directional antenna, protection is required based on simple separation distance. Applications on first and second adjacent channels 277 and 276 are also shown as requiring protection which would preclude the licensed WPVM-LP site, even though the original application for WPVM-LP was filed prior to either of the translator applications and, in fact, it is uncertain that either of the translator applications will ever be grantable.

Translator allocations are based on protection of contours. LPFM allocations are not based on contours, but only on separation distances. It is therefore possible for translator applications to block LPFM applications in areas where the translators provide no service. The consequence of the application of different allocation criteria is to deny service, which is by itself contrary to the public interest, convenience and necessity.

Mountain Area Information Network
Allocation Table
Licensed Channel

REFERENCE
35 31 39 N.
82 29 49 W.

CLASS = L1
Current Spacings
Channel 278 - 103.5 MHz

DISPLAY DATES
DATA 08-17-05
SEARCH 08-22-05

Call		Channel	Location		Azi	Dist	FCC	Margin
WPVM-L	LIC	278L1	Asheville	NC	0.0	0.00	24.0	-24.00
W251AO	APP-D	278D	Black Mountain	NC	64.9	12.75	26.0	-13.25
AP276	APP	276D	Skyland	NC	192.7	5.14	8.0	-2.86
AP277	APP	277D	Woodfin	NC	326.2	12.26	15.0	-2.74
WIMZFM	LIC	278C	Knoxville	TN	301.8	129.81	130.0	-0.19
AP277	APP	277D	Black Mountain	NC	50.4	17.70	15.0	2.70
W279AI	LIC	279D	Hendersonville	NC	184.8	24.27	15.0	9.27
AP275	APP	275D	Black Mountain	NC	50.4	17.70	8.0	9.70
AP276	APP	276D	Black Mountain	NC	50.4	17.70	8.0	9.70
WOLT	LIC	277A	Greer	SC	150.9	67.17	56.0	11.17
AP276	APP	276D	Hendersonville	NC	184.9	24.28	8.0	16.28
AP275	APP	275D	Hendersonville	NC	184.9	24.28	8.0	16.28
W225AZ	CP	225D	Hendersonville	NC	184.8	24.27	3.0	21.27
AP281	APP-D	281D	Flat Rock	NC	170.0	32.07	8.0	24.07
WIKQ	LIC	276A	Tusculum	TN	349.7	67.71	29.0	38.71
To Channel 276C3 per one-step application BPH-970304IA								
WXIS	LIC	280A	Erwin	TN	8.6	68.45	29.0	39.45
WXIS.C	CP	280A	Erwin	TN	8.5	68.51	29.0	39.51
WKVS.C	CP -N	277A	Lenoir	NC	59.5	98.84	56.0	42.84
WKVS	LIC-N	277A	Lenoir	NC	59.5	98.90	56.0	42.90
WSOCFM	LIC-N	279C	Charlotte	NC	100.1	167.29	120.0	47.29
WOLI	LIC	280A	Easley	SC	182.0	76.41	29.0	47.41
W237AR	APP-D	275D	Hazelwood, Etc.	NC	262.7	55.85	8.0	47.85
RADD	ADD	281A	Sylva	NC	254.0	79.38	29.0	50.38
WLYT	LIC	275C1	Hickory	NC	95.8	124.81	73.0	51.81
W277AL	LIC	277D	Highlands	NC	230.5	85.06	15.0	70.06
AP276	APP	276D	Frankland	NC	253.9	79.45	8.0	71.45

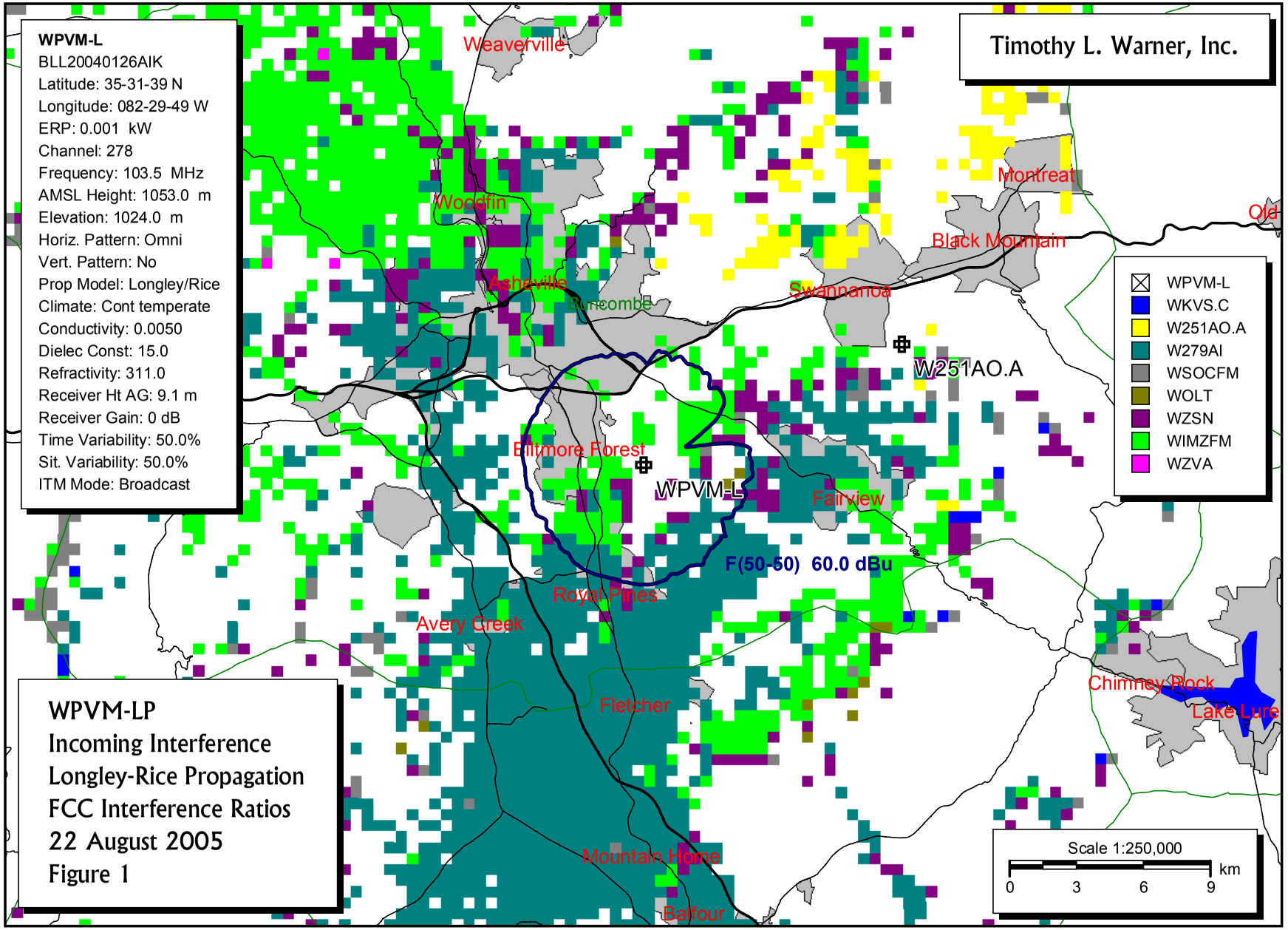
Mountain Area Information Network
Allocation Table
Alternate Channel 235

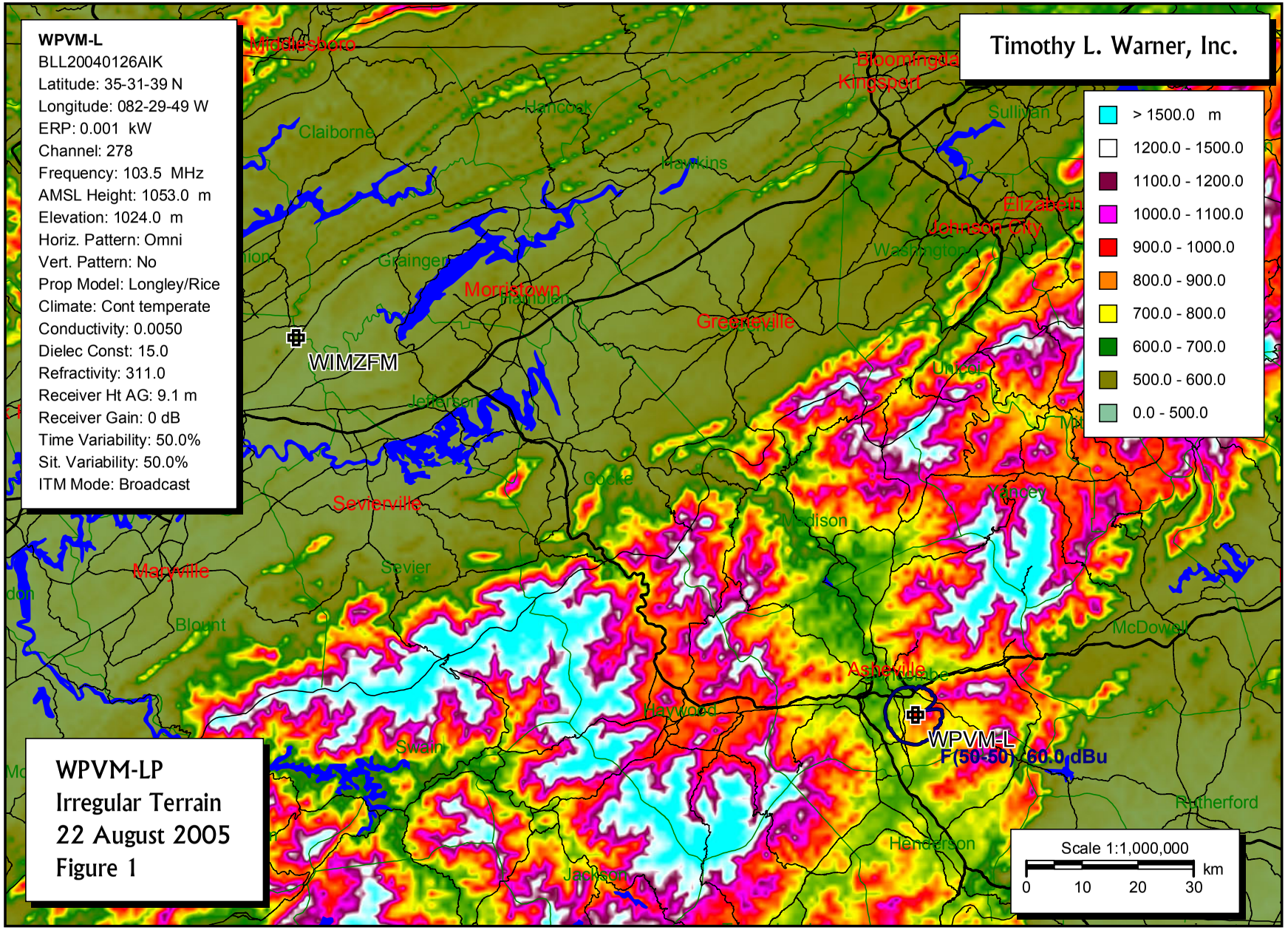
REFERENCE
35 31 39 N.
82 29 40 W.

CLASS = L1
Current Spacings
Channel 237 - 95.3 MHz

DISPLAY DATES
DATA 08-17-05
SEARCH 08-22-05

Call		Channel	Location		Azi	Dist	FCC	Margin
RDEL	DEL	235C	Greenville	TN	343.8	63.41	93.0	-29.59
WAEZ	LIC-D	235C	Greeneville	TN	343.8	63.41	93.0	-29.59
RADD	ADD	235C0	Greenville	TN	343.8	63.41	84.0	-20.59
AL237	VAC	237A	Dillsboro	NC	244.2	66.63	67.0	-0.37
Alternate site 14.5 km SE								
WNKS	LIC	236C	Charlotte	NC	98.2	122.96	120.0	2.96
W239AQ	CP	239D	Black Mountain	NC	68.7	12.37	8.0	4.37
970915	APP	240D	Cruso	NC	239.7	29.43	21.0	8.43
Translator for WLFJ, Greenville, SC								
AP236	APP	236D	Black Mountain	NC	185.4	24.30	15.0	9.30
AP237	APP-D	237D	Tryon	NC	142.0	36.83	26.0	10.83
W237AR	LIC	237D	Hazelwood, Etc.	NC	262.7	56.07	39.0	17.07
AP240	APP	240D	Cruso	NC	239.7	29.42	8.0	21.42
RADD	ADD	290C2	Weaverville	NC	316.2	43.34	12.0	31.34
RADD	ADD	290A	Clyde	NC	249.4	37.44	6.0	31.44
AP235	APP	235D	Brevard	NC	205.9	39.96	8.0	31.96
WNGR-L	LIC	238L1	Tigerville	SC	167.7	51.95	14.0	37.95
WWOK-L	LIC	237L1	Greenville	SC	173.5	65.50	24.0	41.50
WXRC	LIC-D	239C0	Hickory	NC	93.2	130.16	84.0	46.16
WRZK	LIC-Z	240C2	Colonial Heights	TN	355.7	111.17	53.0	58.17
W239AT	CP	239D	Greer	SC	159.7	70.03	8.0	62.03
AP290	APP	290D	Sylva	NC	255.0	68.38	3.0	65.38
W238AW	CP	238D	West View	SC	146.0	81.55	15.0	66.55
NEW .C	CP	238L1	Greenville	SC	172.1	80.88	14.0	66.88
AU062	VAC	237A	Due West	SC	176.6	137.85	67.0	70.85
ADD - Site restriction of 5.5 kilometers (3.4) south								
W235AQ	CP	235D	Mauldin	SC	166.8	79.80	8.0	71.80
AL240	VAC	240A	Pendleton	SC	194.8	101.02	29.0	72.02
NULL								
AP235	APP	235D	Easley	SC	186.1	80.14	8.0	72.14

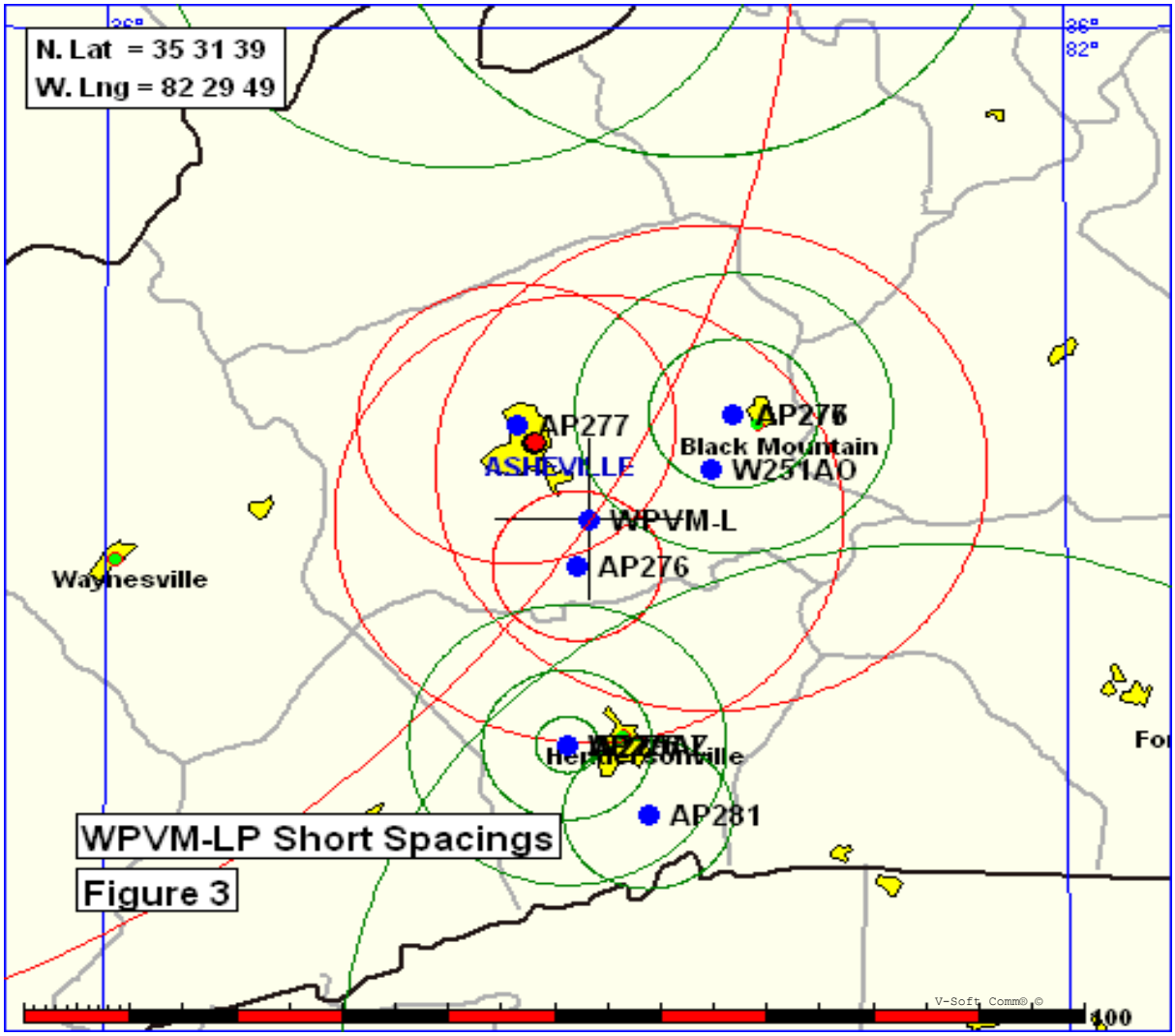

WPVM-L
BLL20040126AIK
Latitude: 35-31-39 N
Longitude: 082-29-49 W
ERP: 0.001 kW
Channel: 278
Frequency: 103.5 MHz
AMSL Height: 1053.0 m
Elevation: 1024.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0050
Dielec Const: 15.0
Refractivity: 311.0
Receiver Ht AG: 9.1 m
Receiver Gain: 0 dB
Time Variability: 50.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast
Timothy L. Warner, Inc.
Weaverville
Woodfin
Asheville
Buncombe
Montreat
Black Mountain
Old
Swannanoa
W251AO.A
Biltmore Forest
WPVM-L
Fairview
F(50-50) 60.0 dBu
Royal Pines
Avery Creek
Fletcher
Chimney Rock
Lake Lure
Mountain Home
Balfour
WPVM-L
WKVS.C
W251AO.A
W279AI
WSOCFM
WOLT
WZSN
WIMZFM
WZVA
Scale 1:250,000
km
0
3
6
9
WPVM-LP
Incoming Interference
Longley-Rice Propagation
FCC Interference Ratios
22 August 2005
Figure 1


WPVM-L
BLL20040126AIK
Latitude: 35-31-39 N
Longitude: 082-29-49 W
ERP: 0.001 kW
Channel: 278
Frequency: 103.5 MHz
AMSL Height: 1053.0 m
Elevation: 1024.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0050
Dielec Const: 15.0
Refractivity: 311.0
Receiver Ht AG: 9.1 m
Receiver Gain: 0 dB
Time Variability: 50.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast
Timothy L. Warner, Inc.
> 1500.0 m
1200.0 - 1500.0
1100.0 - 1200.0
1000.0 - 1100.0
900.0 - 1000.0
800.0 - 900.0
700.0 - 800.0
600.0 - 700.0
500.0 - 600.0
0.0 - 500.0
WIMZFM
WPVM-L
F(50-50) 60.0 dBu
Middlesboro
Bloomingdale
Kingsport
Claiborne
Hancock
Hawkins
Sullivan
Elizabeth
Johnson City
Washington
Grainger
Morristown
Hamblen
Greeneville
Unicoi
Jefferson
Cocke
Sevierville
Yancey
Madison
Maryville
Sevier
Blount
McDowell
Asheville
Haywood
Swain
Rutherford
Henderson
Jackson
WPVM-LP
Irregular Terrain
22 August 2005
Figure 1
Scale 1:1,000,000
km
0
10
20
30

CH 278 L1, 103.5 MHz

Mountain Area Information Net

Allocation Study



Data Date:08-17-05 Job Date:08-22-05

Call	CH#	Type	Location		Azi	D-KM	FCC	Margin
WPVM-L	278L1	LIC	Asheville	NC	0.0	0.00	24.0	-24.00
W251AO	278D	APP-D	Black Mountain	NC	64.9	12.75	26.0	-13.25
AP276	276D	APP	Skyland	NC	192.7	5.14	8.0	-2.86
AP277	277D	APP	Woodfin	NC	326.2	12.26	15.0	-2.74
WIMZFM	278C	LIC	Knoxville	TN	301.8	129.81	130.0	-0.19
AP277	277D	APP	Black Mountain	NC	50.4	17.70	15.0	2.70
W279AI	279D	LIC	Hendersonville	NC	184.8	24.27	15.0	9.27
AP276	276D	APP	Black Mountain	NC	50.4	17.70	8.0	9.70
AP275	275D	APP	Black Mountain	NC	50.4	17.70	8.0	9.70
WOLT	277A	LIC	Greer	SC	150.9	67.17	56.0	11.17
AP275	275D	APP	Hendersonville	NC	184.9	24.28	8.0	16.28
AP276	276D	APP	Hendersonville	NC	184.9	24.28	8.0	16.28
W225AZ	225D	CP	Hendersonville	NC	184.8	24.27	3.0	21.27
AP281	281D	APP-D	Flat Rock	NC	170.0	32.07	8.0	24.07
WIKQ	276A	LIC	Tusculum	TN	349.7	67.71	29.0	38.71
WXIS	280A	LIC	Erwin	TN	8.6	68.45	29.0	39.45
WXIS.C	280A	CP	Erwin	TN	8.5	68.51	29.0	39.51

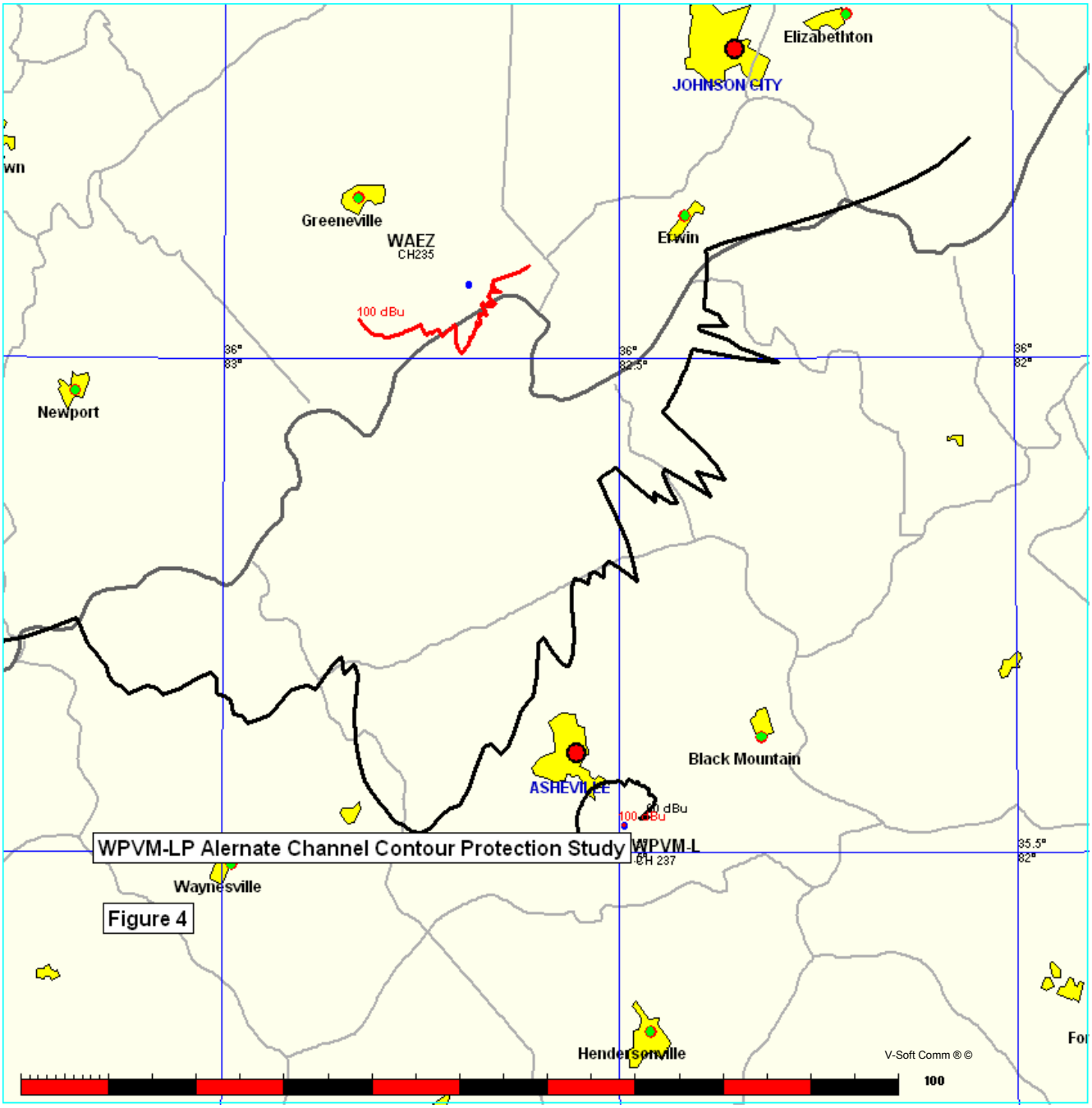
Mountain Area Information Net
Allocation Study

FMCommander Allocation Study
08-22-2005

WPVM-L CH 237 L1
.001 kW 1053 M COR
Prot. = 60 dBu
Intef. = 100 dBu

WAEZ CH 235 C BLH19810320AH
100 kW, 1042 M COR DA
Prot. = 60 dBu
Intef. = 100 dBu

Scale = 1:1,125,000



WPVM-LP Alernate Channel Contour Protection Study

Figure 4